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EXAMINER

PEFFLEY, MICHAEL F

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JEFFREY A. HALL and MUDIT JAIN

Appeal 2010-010450
Application 10/698,026
Technology Center 3700

Before ERIC GRIMES, STEPHEN WALSH, and ERICA A. FRANKLIN,
Administrative Patent Judges.

GRIMES, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a tissue ablation system. The Examiner has rejected the claims as anticipated or obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Claims 16-22 are on appeal. The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Claim 16 is representative and reads as follows:

16. A system for delivering RF energy to an endocardial tissue, the system comprising:

a catheter having one or more electrodes proximate a distal end of the catheter, the catheter configured for being positioned such that the one or more electrodes are adjacent the endocardial tissue, at least one of the electrodes including a tip electrode having a thermal time constant of approximately 240 ms; and

a power control system configured to provide power to the tip electrode, the power having a plurality of alternating on portions and off portions, one set of adjacent on and off portions defining a duty cycle;

wherein the power control system delivers an energy pulse of between approximately 0.01 ms to 4 ms via the tip electrode, and the on portions and off portions of the duty cycle have a ratio of between 50% - 100%.

The claims stand rejected as follows:

- Claims 16, 17, and 19-22 under 35 U.S.C. § 102(b) as anticipated by, or alternatively under 35 U.S.C. § 103(a) as obvious in view of, Sherman '778¹ (Answer 3);

- Claim 18 under 35 U.S.C. § 103(a) as obvious in view of Sherman '778 (Answer 5); and

- Claims 16-22 under 35 U.S.C. § 103(a) as obvious in view of Sherman '778 and Sherman '980² (Answer 6).

The Examiner has rejected all of the claims on appeal as anticipated by Sherman '778 or obvious in view of Sherman '778, by itself or combined with Sherman '980. Because Appellants have waived any arguments based on Sherman '980 (*see* Appeal Br. 10-11), we will address the Examiner's rejections together.

¹ Sherman, US 6,059,778, issued May 9, 2000.

² Sherman, US 5,971,980, issued Oct. 26, 1999.

The Examiner finds that Sherman '778 discloses an ablation system comprising a catheter with a tip electrode (Answer 3) and a power control system that delivers an energy pulse of 0.01 ms to 4 ms, with alternating on and off portions (duty cycles) having a ratio of 50-100% (*id.* at 3-4). Regarding the thermal time constant, the Examiner reasons that, since Sherman '778 discloses that its ring electrodes can be made of platinum, "it would have been obvious, if not inherent, to have the tip electrode 36 also comprise platinum" (*id.* at 4). The Examiner finds that a tip electrode made of platinum and having the size disclosed by Sherman '778 would have a thermal time constant of approximately 240 ms (*id.*).

Appellants contend that Sherman '778 does not disclose several limitations of claim 16 (Appeal Br. 9) and the Examiner has not shown that the limitations not expressly disclosed are inherent (*id.* at 9-10).

We conclude that the Examiner has provided sufficient evidence to support a *prima facie* case of obviousness, which Appellants have not rebutted. Sherman '778 discloses "an apparatus for delivering energy to a biological site comprising a catheter having a plurality of electrodes at its distal end" (Sherman '778, col. 3, ll. 28-30). Sherman '778 discloses that its apparatus is for radio frequency (RF) ablation (*id.* at col. 1, ll. 5-8). The electrodes in the apparatus include band electrodes 32 and "may include a tip electrode 36" (*id.* at col. 6, ll. 17-20).

"The apparatus also includes . . . a power control system providing power to each of the electrodes" (*id.* at col. 3, ll. 33-36); i.e., including the tip electrode if present. Sherman '778 discloses that "the power ha[s] a duty cycle with an on period and an off period" (*id.* at col. 3, ll. 36-37). "At a

frequency of 500 kHz, an 8-bit control has a period or time frame of 0.5 msec. At a fifty-percent duty cycle, the electrode is in the off period only 0.25 msec.” (*Id.* at col. 7, ll. 44-46.)

Thus, Sherman ‘778 expressly discloses a system for delivering energy (including RF energy) comprising a catheter and electrodes (including a tip electrode) and a power control system that provides power having duty cycles (on periods and off periods), where, for example, a 50% duty cycle provides an on period (energy pulse) and an off period of 0.25 msec.

Appellants argue that they

cannot find in the cited reference . . . a power control system configured to provide power to the tip electrode; and wherein the power control system delivers an energy pulse of between approximately 0.01 ms to 4 ms via the tip electrode, and the on portions and off portions of the duty cycle have a ratio of between 50% -100%, as recited in claim 16.

(Appeal Br. 9.) These limitations, however, are expressly disclosed by Sherman ‘778, as discussed above.

Appellants also argue that they “cannot find in the cited reference: a tip electrode having a thermal time constant of approximately 240 ms. . . . There is no discussion of any details of tip electrode 36.” (*Id.* at 9.)

The Examiner, however, has found that

[s]ince the ring electrodes 32 of Sherman comprise platinum (col. 6, ln. 36-41), it would have been obvious, if not inherent, to have the tip electrode 36 also comprise platinum. Sherman further discloses that the tip electrode has a diameter of 2.3 mm, which is equal to 0.091 inches (col. 6, ln. 52-53). Since the tip electrode of Sherman comprises platinum and practically has the exact same diameter (0.091 inches vs. 0.094 inches) as the platinum tip of applicant’s device, it would have been obvious,

if not inherent, for the electrode tip of Sherman to have a thermal time constant of approximately 240 ms.

(Answer 4.)

The Examiner has provided a reasonable basis for concluding that a tip electrode with a thermal time constant of 240 ms would have been obvious based on Sherman '778. Sherman '778 discloses that the “band electrodes **32** are formed of a material having a significantly higher thermal conductivity than that of the biological tissue **26**. Possible materials include . . . platinum.” (Sherman '778, col. 6, ll. 36-40.) Sherman '778 discloses that “[i]n a preferred embodiment, the electrodes **32** are 7 French (2.3 mm in diameter)” (*id.* at col. 6, ll. 51-52).

Thus, Sherman '778 suggests that the band electrodes of its device be made of platinum and have a diameter of 2.3 mm. Although Sherman '778 does not disclose that these suggestions also apply to the tip electrode, it would have been obvious to apply them to the tip electrode since Sherman '778 does not suggest any different sizes or materials for the tip electrode.

Regarding the thermal time constant required by the claims, the Examiner finds that the tip electrode suggested by Sherman '778 would inherently have a thermal time constant of approximately 240 ms, based on evidence provided by Appellants' Specification itself; specifically, that a platinum electrode having a diameter of 0.094 inches has a thermal time constant of 240 ms (Answer 4; Office Action mailed Feb. 9, 2009, at page 3; *see also* Spec. 3:22 to 4:2).

Appellants have not disputed the Examiner's finding that a tip electrode made of platinum and having the size suggested by Sherman '778 would have a thermal time constant of approximately 240 ms (*see* Appeal

Br. 9-10). Since the Examiner has provided a reasonable basis for finding that the disputed limitation would have been inherent in the device suggested by Sherman '778, and Appellants have provided no reasonable basis for doubting that finding, Appellants' argument that Sherman '778 does not expressly disclose the limitation does not persuade us that the Examiner's rejection is in error.

SUMMARY

We affirm the rejection of claims 16, 17, and 19-22 as obvious based on Sherman '778, the rejection of claim 18 as obvious based on Sherman '778, and the rejection of claims 16-22 as obvious based on Sherman '778 and Sherman '980.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

cdc